National Center for Sustainable Transportation

POLICY BRIEF

Emissions Information Can Prompt Travelers to Purchase Greener Flights

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Issue

Air travel is estimated to contribute as much as 2.5% of worldwide greenhouse gas emissions, and this proportion is expected to grow. Low carbon aviation options are not yet readily available. However, different flight itineraries for the same origin and destination can vary greatly in terms of their carbon emissions, depending mainly on the number and location of connections and aircraft type. In regions with multiple airports (which is quite common), traveling a little further to an airport that offers a nonstop flight rather than taking a flight with connections from the nearest airport is the lowest net carbon choice regardless of travel modes to and from the airport. The University of California system and other large institutions have the potential to promote lower-emissions business air travel by providing information about the carbon emissions of alternative flight choices when employees conduct online flight search and booking for work-related travel. Doing so could play a role in meeting these institutions' goals for reducing carbon emissions.

Researchers at the University of California, Davis, surveyed over 450 UC Davis faculty, researchers, and staff, and asked them to choose among hypothetical flight options for domestic and international university-related business trips. The hypothetical flight options were developed using actual data on UC Davis employee air travel and available flights. The survey prominently presented emissions estimates for different flight alternatives alongside price, with the lowest-emissions option labeled "greenest flight" (Figure 1). Researchers then estimated the effect that changing the current UC Davis flight-search interface to prominently display emissions, label the greenest flight choice, and present an alternative departure airport could have on the emissions and costs of business-related air travel.

Key Research Findings

UC Davis employees were willing to pay more for lower-emissions flights at a rate of about $200 per ton of CO_2-equivalent saved. With all other factors being equal when choosing a hypothetical flight, respondents were willing to pay

Figure 1. Example flight choice option from the survey, illustrating two flights of equal value to UC employees according to the analysis.

more for lower-emissions flights. The rate at which respondents were willing to pay for reduced emissions ($187/ton for domestic flights and $325/ton for international flights) was an order of magnitude higher than that seen in carbon offsets programs. This is particularly significant given that many respondents indicated they felt pressure to select the cheapest flight because of their departments' limited travel budgets.

Emissions information presented during the flight search made nonstop flights from a non-preferred airport more attractive. Without carbon emissions information on different flight options, travelers indicated that a nonstop flight from a non-preferred airport was almost equally desirable as an indirect flight out of a preferred airport. Emissions information could "break the tie" in this situation, encouraging travelers to choose the greener nonstop flight.

UC Davis could reduce its air travel emissions by 79 tons CO_2-equivalent and its airfare costs by $56,000 per year with simple changes to its flight-search interface. The estimated emissions savings represent 4% of total emissions associated with all air travel booked on the university travel portal, and can be achieved by modifying the current UC Davis flight-search interface to prominently display emissions, label the greenest flight choice, and present flight options from an alternative departure airport (such as San Francisco). In addition to the emissions savings, UC Davis could save $56,000 annually in airfare costs due to travelers' increased willingness to take advantage of cheaper, lower-emissions flight options out of San Francisco (although these savings could be partially offset by higher ground transportation costs).

Policy Implications

Given the UC system's goal of reducing transportation emissions, including those of business travel, by 20% from 2010 levels by 2020, an easily achieved 4% emissions savings is clearly worthwhile. The UC system could consider making additional, non-travel funds available to cover the cost differences for lower-emissions flights to achieve even greater emissions savings. Institutionalizing this "nudge" within organizations with large travel budgets, like the UC system, could have an industry-wide impact in aviation. Many consumers making lower-carbon flight choices could encourage airlines to invest in more efficient aircraft and sustainable aviation fuels. Highlighting emissions information during flight search also has an educational benefit and may increase personal awareness of air travel emissions. This could ultimately influence regulation and public investment in regional transportation options to alternative airports, the use of biofuels, and the optimization of airline schedules and routes to further prioritize fuel efficiency.

More Information

This policy brief is drawn from "Adding Carbon to the Equation in Online Flight Search," a report from the National Center for Sustainable Transportation, authored by Nina Amenta and Angela Sanguinetti of the University of California, Davis. The full report can be found on the NCST website at https://ncst.ucdavis.edu/project/adding-carbon-equation-online-flight-search-promote-lower-emissions-air-travel.

For more information about the findings presented in this brief, please contact Nina Amenta at amenta@cs.ucdavis.edu.

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